

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

1962-3
057-33

U. S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
CENTRAL STATES FOREST EXPERIMENT STATION
COLUMBUS, OHIO

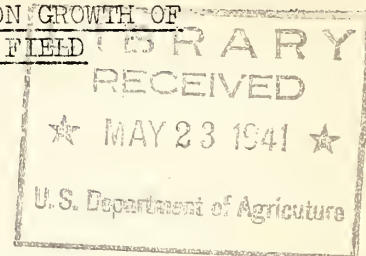
Technical Note 28

February 15, 1941

EFFECT OF SCREEN PROTECTION ON FIRST-SEASON GROWTH OF
YELLOW POPLAR PLANTED IN AN OLD FIELD

by

W. H. Cummings



Plantings of yellow poplar are difficult to establish on many old field sites in southern Ohio. Particularly those seedlings planted on bare, exposed spots evidence very poor height growth if they survive at all. Thrifty natural reproduction generally occurs on spots that are somewhat protected from air movement and intense sunshine. Whether height growth of yellow poplar seedlings planted in an open field can be markedly increased by setting screen enclosures about individual trees is a question now under test in a small field experiment. The experiment is located in a mixed planting of yellow poplar and black walnut on a lower easterly old-field slope with a cover of grass and weeds near Longstreth, Hocking County, Ohio. Forty-five yellow poplars were selected for treatment in the spring of 1940, a few weeks after planting.

Four types of open-top screen enclosures are being used, namely, 1-foot and $1\frac{1}{2}$ -foot cylinders 5.6 inches in diameter, and 1-foot and $1\frac{1}{2}$ -foot cone frustums 3.7 inches in diameter at the ground and 7.5 inches across the top. The required sections were cut from a roll of 12-mesh black enameled screening 3 feet wide, rolled into form, and stapled along edges overlapped $\frac{1}{2}$ inch. Nine screen forms of each type and 9 unscreened checks were assigned completely at random to the 45 yellow poplars. The screen forms were tacked along the line of stapling to stakes $1\frac{1}{2}$ or 2 feet long. Stakes were set on the west side of trees to a depth of $\frac{3}{8}$ foot, bringing the encircling screen flush with the ground. Unscreened check trees also were staked.

Examination of the yellow poplar screening experiment in the fall of 1940 showed that all 45 trees had survived the first field growing season. Height increment of the nine trees subjected to each treatment averaged as follows:

<u>Type of</u> <u>screen enclosure</u>	<u>Height increment</u> <u>in first field season</u>
	<u>Feet</u>
Cylinder $1\frac{1}{2}$ feet high	0.49
Cone frustum $1\frac{1}{2}$ feet high	.40
Cylinder 1 foot high	.36
Cone frustum 1 foot high	.31
Unscreened, check	.14

The average height growth of yellow poplar trees in the $1\frac{1}{2}$ -foot cylinder was over $3\frac{1}{2}$ times that of check trees, and that of trees in the $1\frac{1}{2}$ -foot cone frustum was almost 3 times that of check trees. The notable increase in height growth of yellow poplar in the $1\frac{1}{2}$ -foot enclosures is attributed to protection by the screen.

The screen used reduces the intensity of light striking at right angles by about 29 percent; however, the open-topped forms afford scant protection against the intense sunshine when the sun is at higher altitudes. Protection by the screen forms against air movement and moisture loss is probably of considerable importance. During the first year or two such screens greatly reduce the risk of damage by rodents or fires.

Bought retail in a small roll, the screening in each 1-foot form cost 3.4 cents and that in each $1\frac{1}{2}$ -foot form cost 5.1 cents. Considerable labor was entailed in making up the screen forms and setting them about the planted seedlings. If screen enclosures assure vigorous initial growth and better survival of yellow poplar, the density of planting might be drastically reduced so that on an acre planted the cost of screen procured in quantity might not be prohibitive.

Yellow poplar enclosed in $1\frac{1}{2}$ -foot screen forms evidenced more vigorous initial height growth than seedlings not afforded this protection. The beneficial effect recognized in this small experiment is in accordance with observations that screening protection by vegetation such as sassafras, black locust or broom sedge -- if not too dense -- favors the initial growth and the establishment of yellow poplar planted or naturally seeded on old fields.